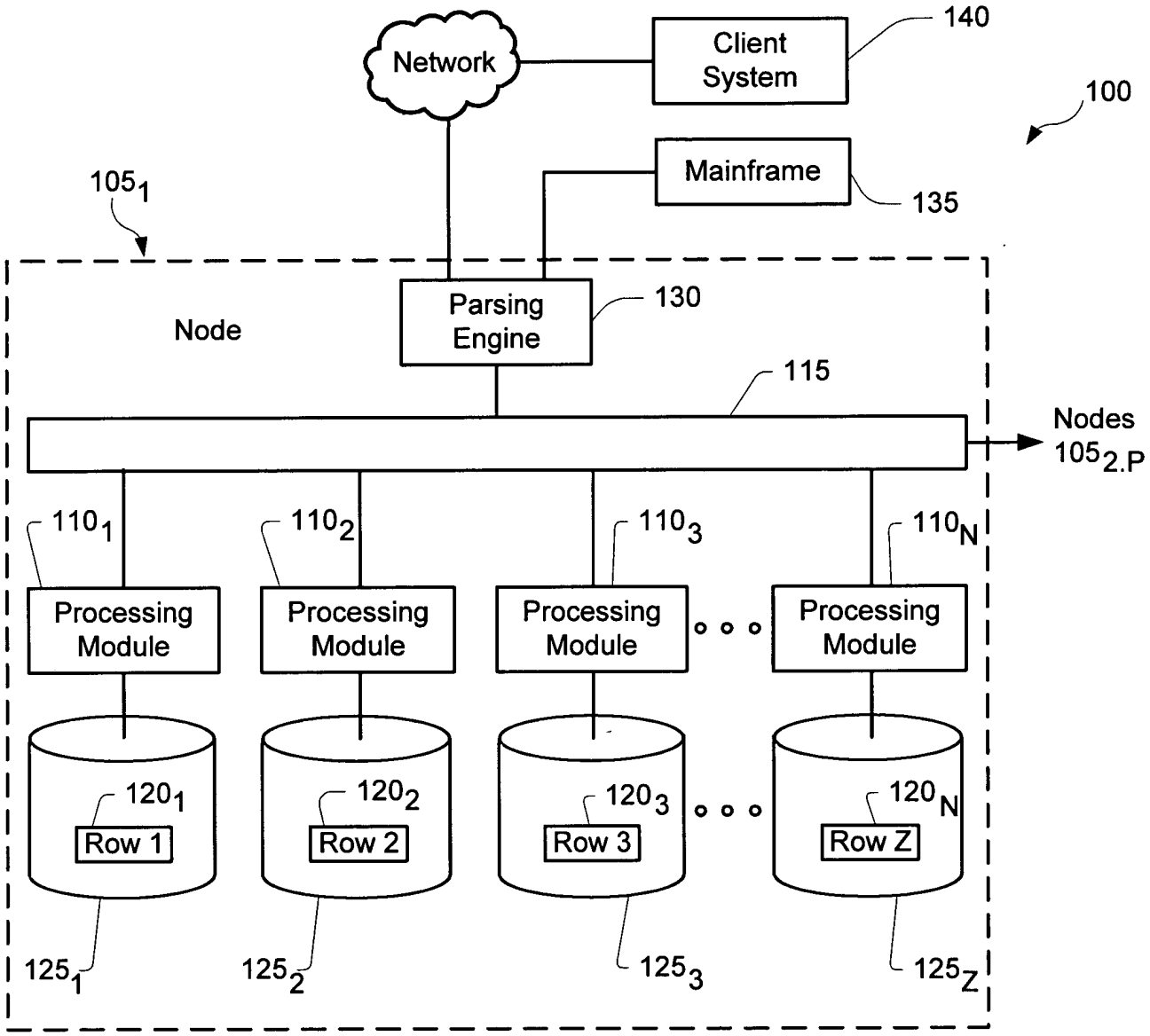

Network
Client System
140
100
Mainframe
135
105_1
Node
Parsing Engine
130
115
Nodes $105_{2.P}$
110_1
110_2
110_3
110_N
Processing Module
Processing Module
Processing Module
Processing Module
120_1
120_2
120_3
120_N
Row 1
Row 2
Row 3
Row Z
125_1
125_2
125_3
125_Z

FIGURE 1

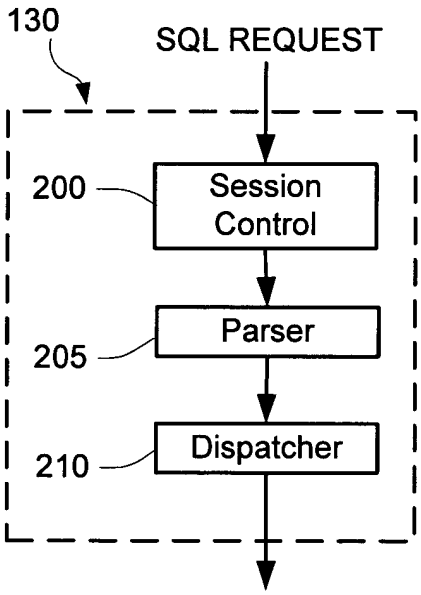

130
SQL REQUEST
200
Session Control
205
Parser
210
Dispatcher

FIGURE 2

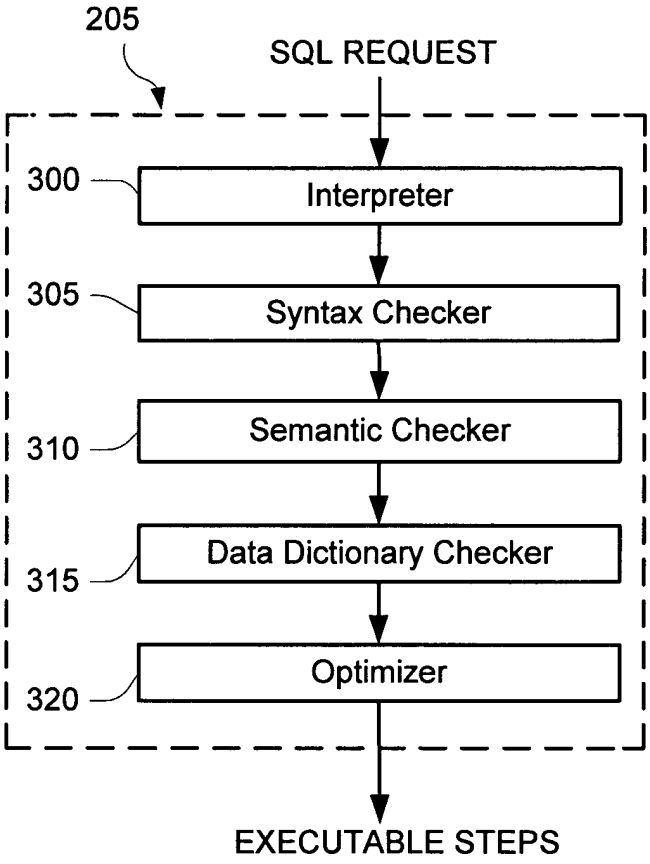

205
SQL REQUEST
300
Interpreter
305
Syntax Checker
310
Semantic Checker
315
Data Dictionary Checker
320
Optimizer
EXECUTABLE STEPS

FIGURE 3

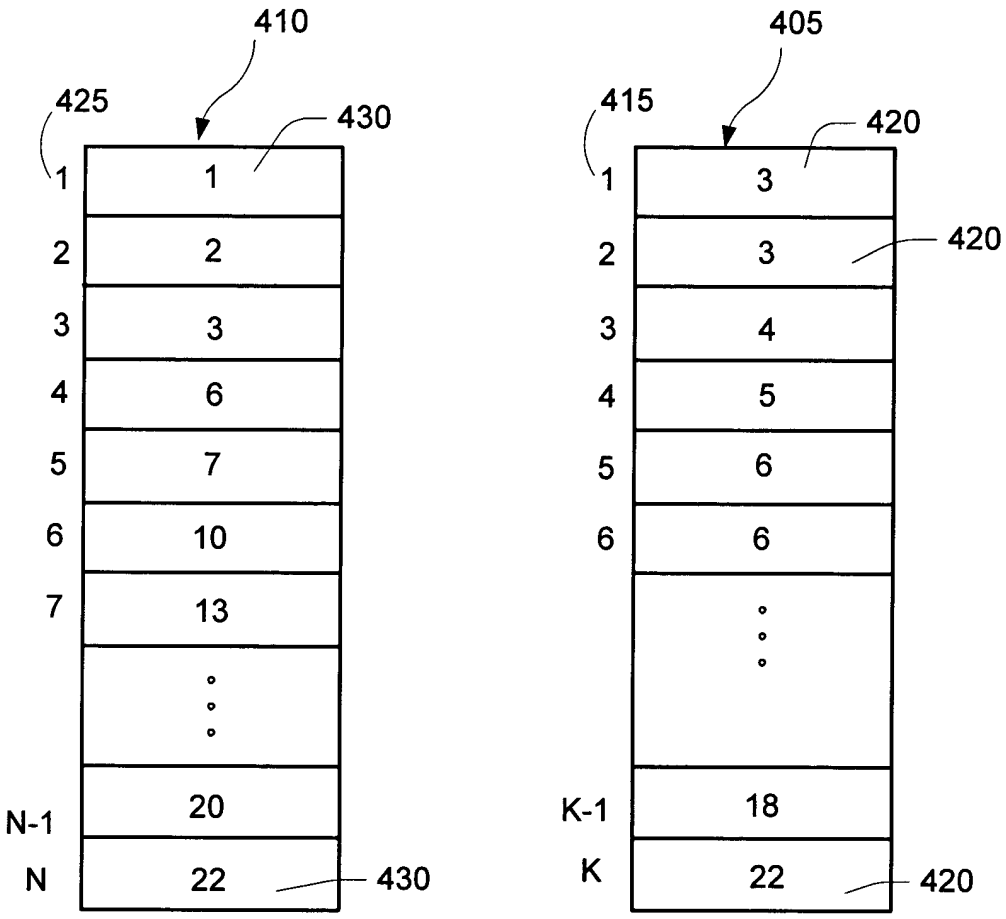

410
425
430
1
2
3
4
5
6
7
N-1
N
1
2
3
6
7
10
13
20
22
430
405
415
420
1
2
3
4
5
6
K-1
K
3
3
4
5
6
6
18
22
420
420

FIGURE 4

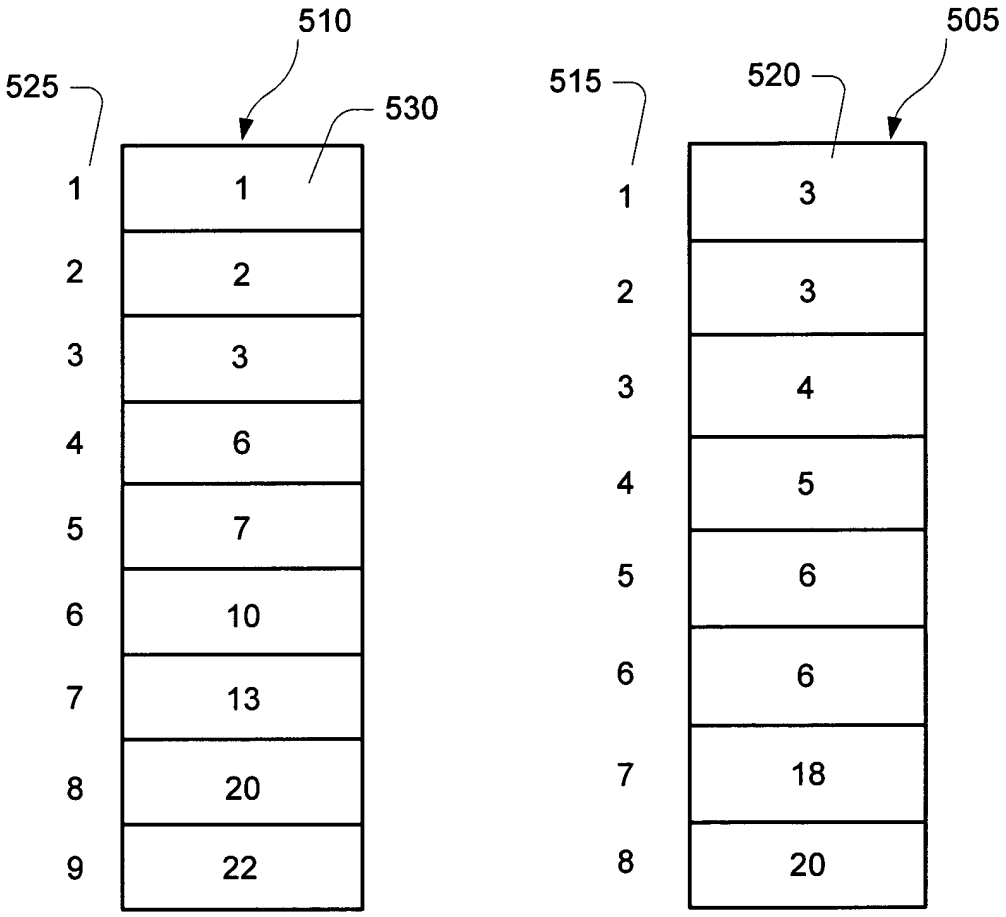

510
525
530
1
2
3
4
5
6
7
8
9
1
2
3
6
7
10
13
20
22
505
515
520
1
2
3
4
5
6
7
8
3
3
4
5
6
6
18
20

FIGURE 5A

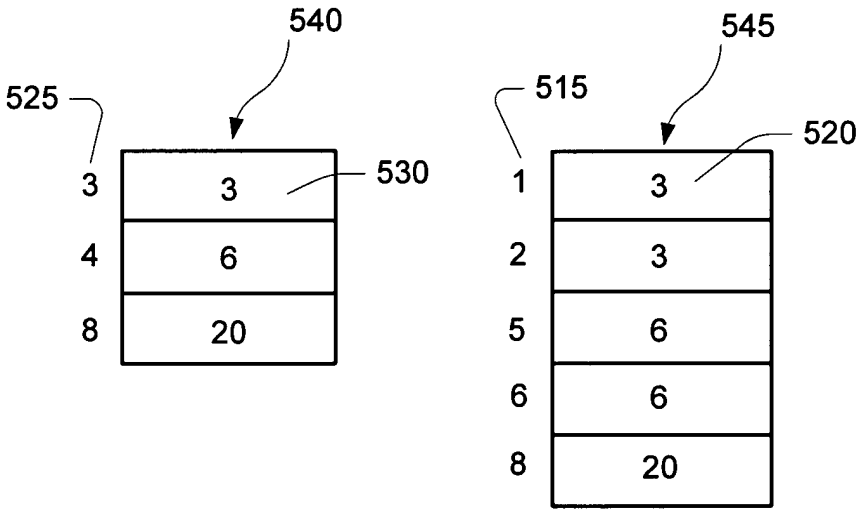


FIGURE 5B

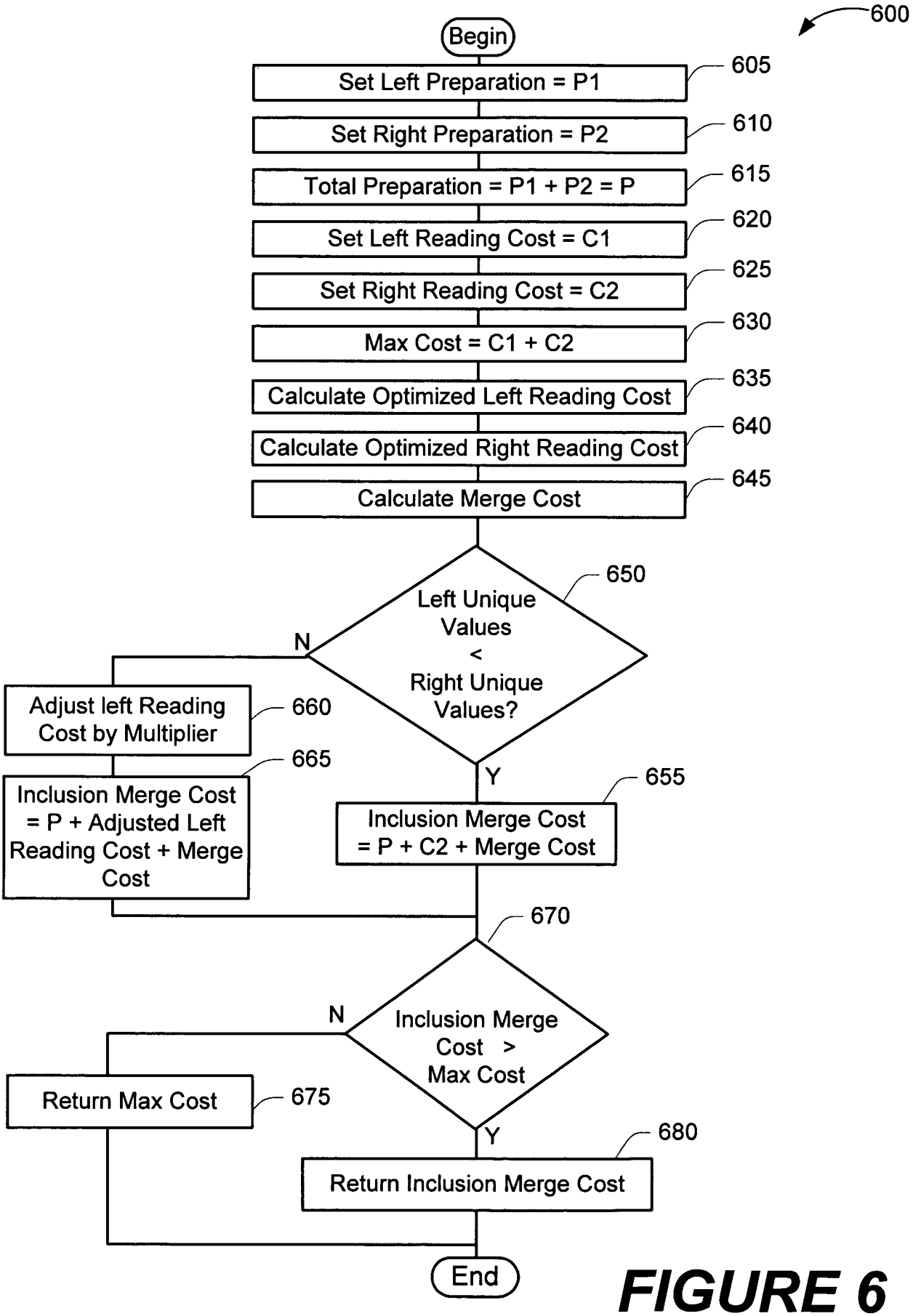

600
Begin
Set Left Preparation = P1
605
Set Right Preparation = P2
610
Total Preparation = P1 + P2 = P
615
Set Left Reading Cost = C1
620
Set Right Reading Cost = C2
625
Max Cost = C1 + C2
630
Calculate Optimized Left Reading Cost
635
Calculate Optimized Right Reading Cost
640
Calculate Merge Cost
645
Left Unique Values < Right Unique Values?
650
N
Y
Adjust left Reading Cost by Multiplier
660
Inclusion Merge Cost = P + Adjusted Left Reading Cost + Merge Cost
665
Inclusion Merge Cost = P + C2 + Merge Cost
655
670
Inclusion Merge Cost > Max Cost
N
Y
Return Max Cost
675
Return Inclusion Merge Cost
680
End

FIGURE 6

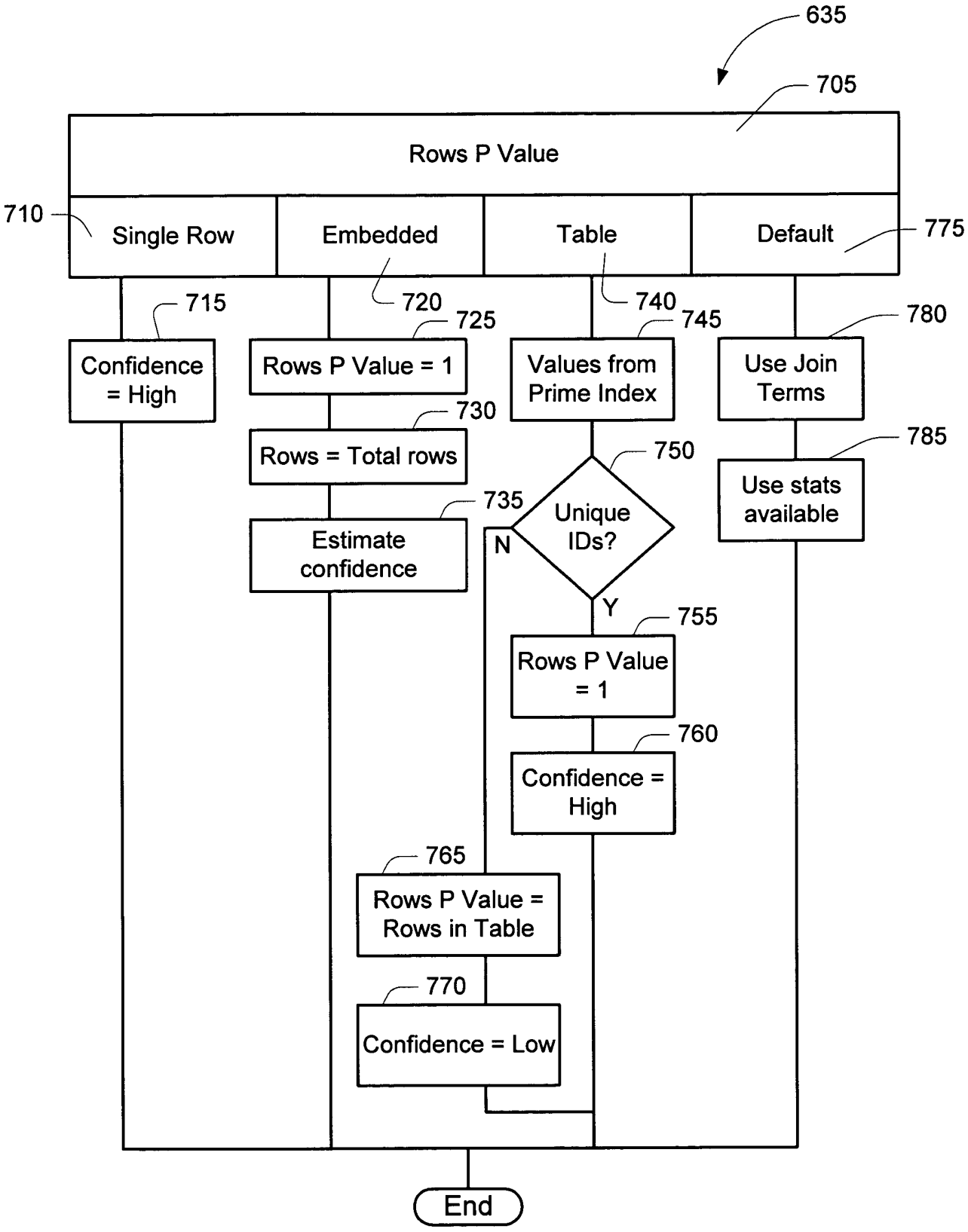

635
705
Rows P Value
710
Single Row
Embedded
Table
Default
775
715
720
740
745
780
725
Confidence = High
Rows P Value = 1
Values from Prime Index
Use Join Terms
730
785
750
Rows = Total rows
Use stats available
735
Unique IDs?
N
Estimate confidence
Y
755
Rows P Value = 1
760
Confidence = High
765
Rows P Value = Rows in Table
770
Confidence = Low
End

FIGURE 7

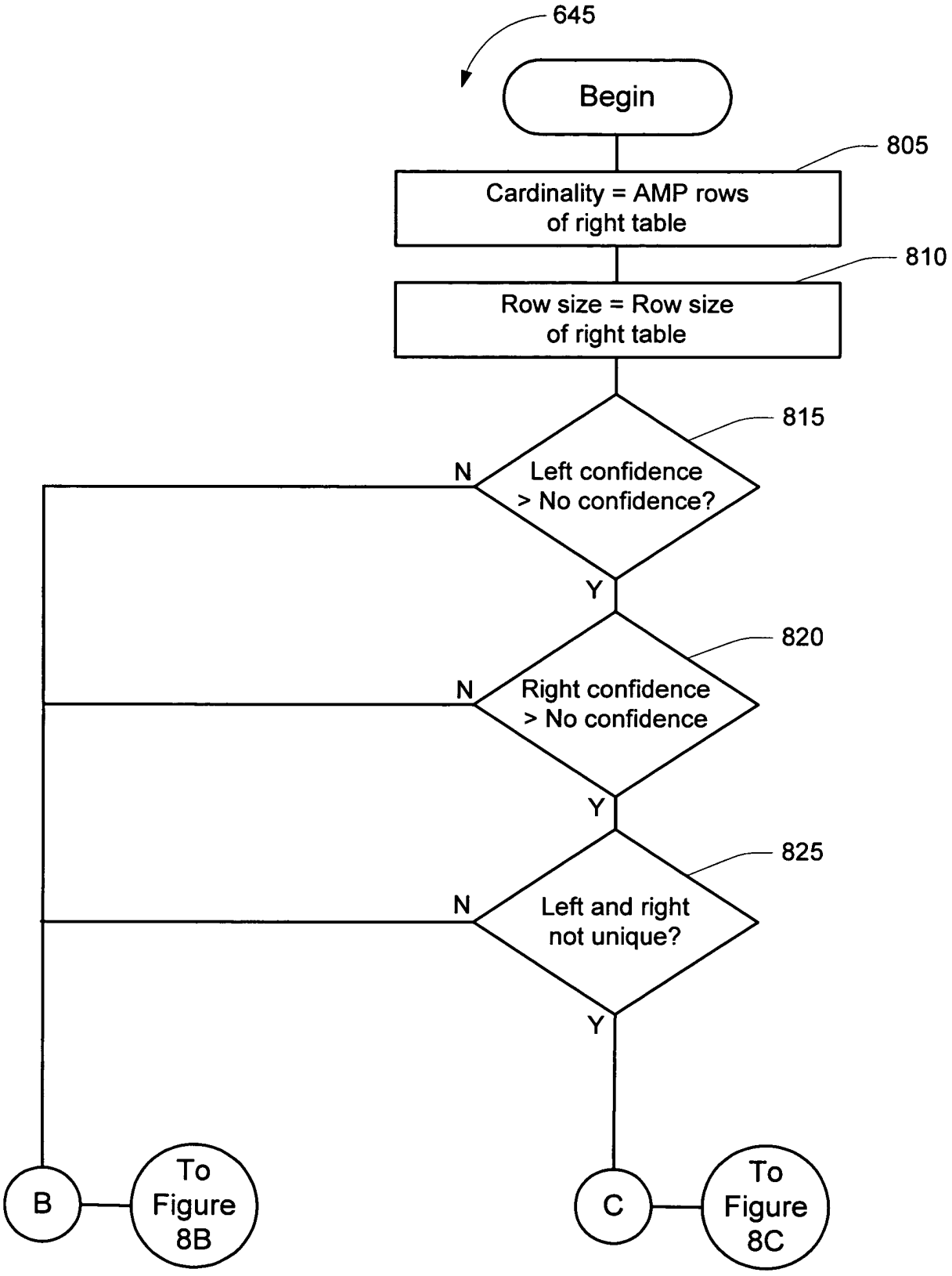
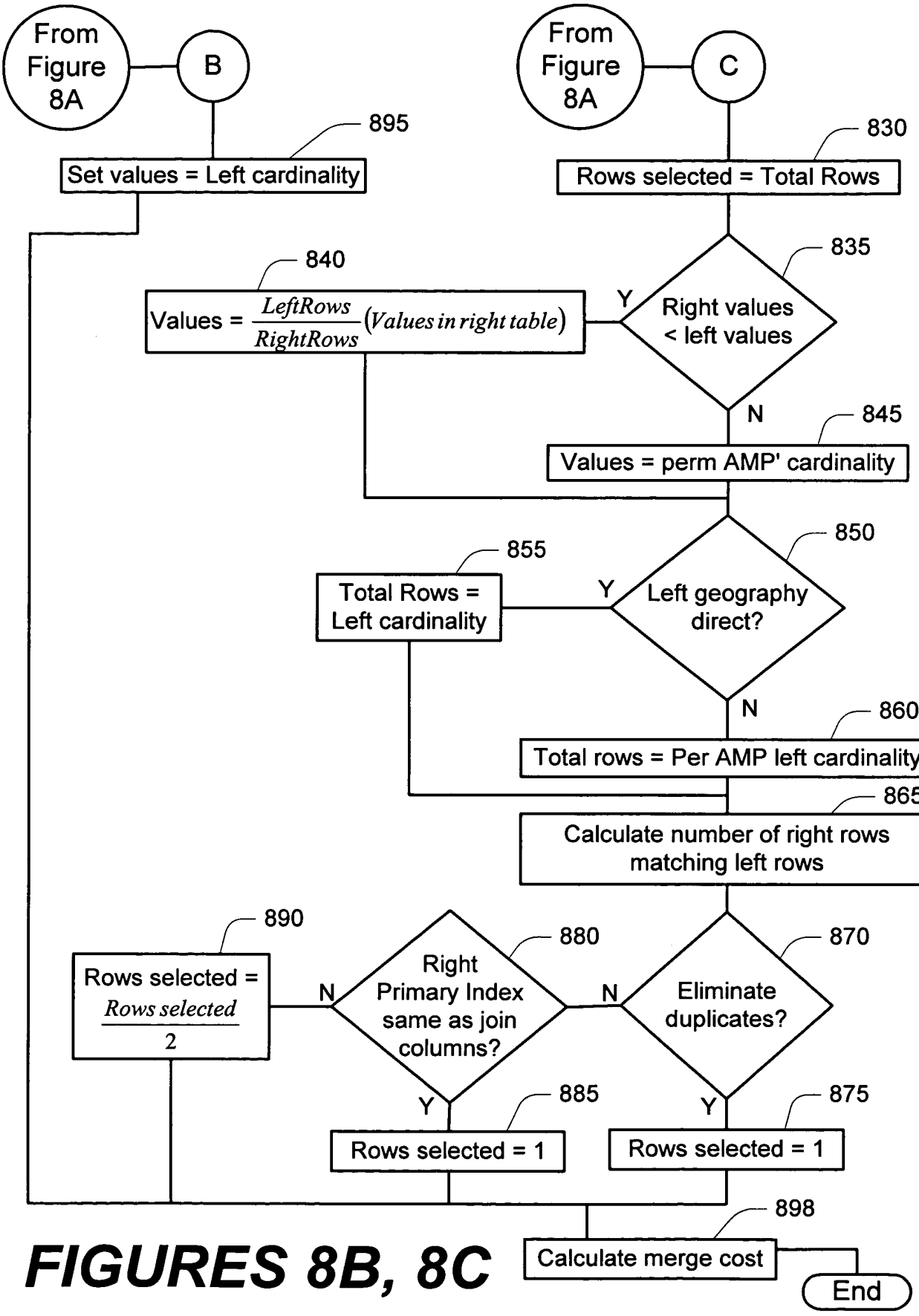

645
Begin
805
Cardinality = AMP rows of right table
810
Row size = Row size of right table
815
Left confidence > No confidence?
N
Y
820
Right confidence > No confidence
N
Y
825
Left and right not unique?
N
Y
B
To Figure 8B
C
To Figure 8C

FIGURE 8A



FIGURES 8B, 8C

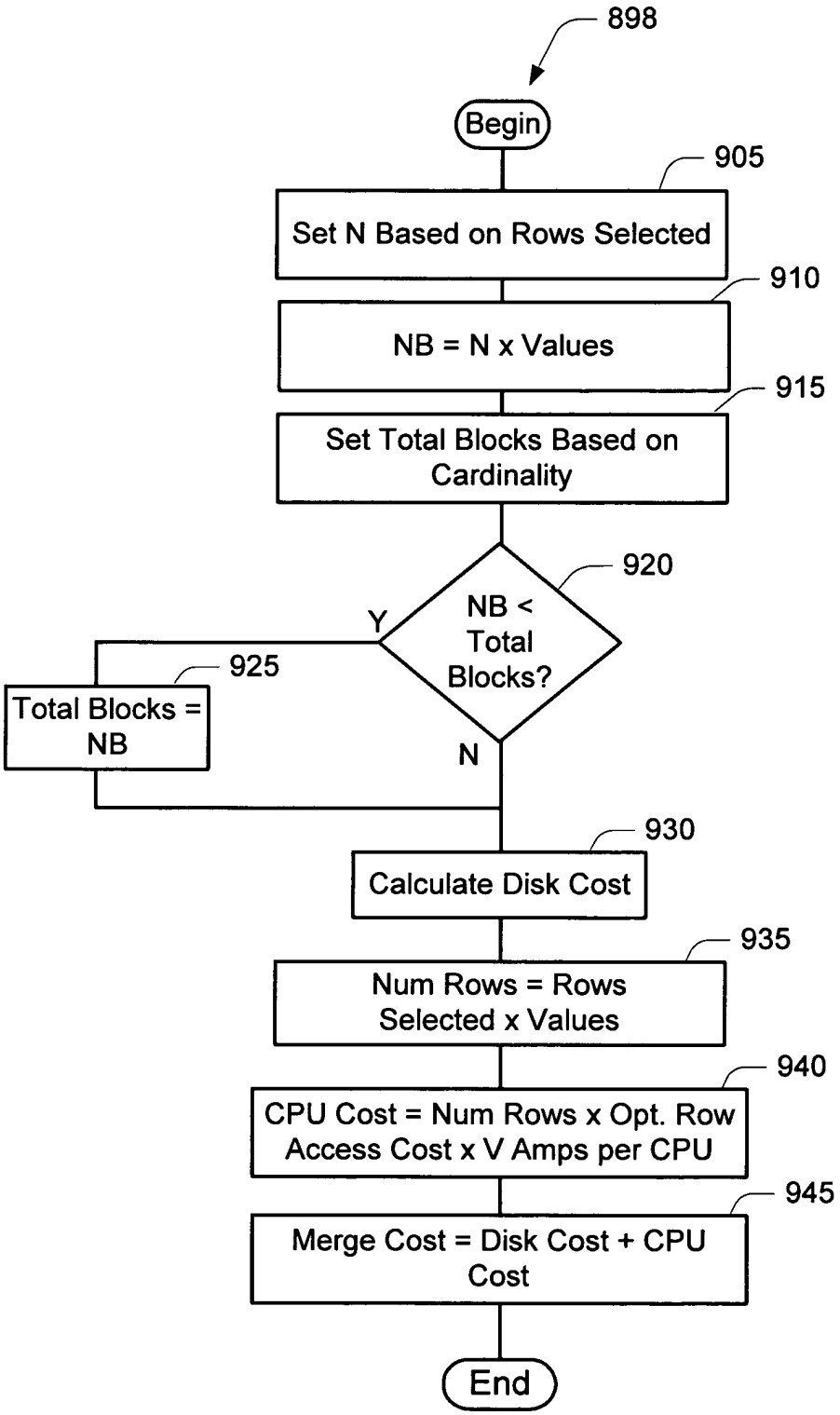

898
Begin
905
Set N Based on Rows Selected
910
NB = N x Values
915
Set Total Blocks Based on Cardinality
920
NB < Total Blocks?
Y
N
925
Total Blocks = NB
930
Calculate Disk Cost
935
Num Rows = Rows Selected x Values
940
CPU Cost = Num Rows x Opt. Row Access Cost x V Amps per CPU
945
Merge Cost = Disk Cost + CPU Cost
End

FIGURE 9